Corbion - Water Security 2022

W0. Introduction

W0.1

(W0.1) Give a general description of and introduction to your organization.

Corbion is a leading food ingredients and biobased chemicals company. We market our products through a worldwide network of sales offices and distributors, and have a global supply chain with manufacturing facilities in the US, Thailand, Brazil, the Netherlands, and Spain. Our innovation centers are located across the globe and our headquarter is based in the Netherlands

In 2021, Corbion generated annual sales of € 1,070.8 million and had a workforce of 2,493 FTEs. Corbion is listed on Euronext Amsterdam.

At Corbion we distinguish between three lines of business, each with a different set of characteristics: Sustainable Food Solutions, Lactic Acid & Specialties and Incubator. These business units are supported company-wide by globally managed R&D, operations, and business support functions.

W-CH0.1a

(W-CH0.1a) Which activities in the chemical sector does your organization engage in?

Specialty organic chemicals

W-FB0.1a

(W-FB0.1a) Which activities in the food, beverage, and tobacco sector does your organization engage in?

Processing/Manufacturing

W0.2

(W0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date
Reporting year	January 1 2021	December 31 2021

W0.3

(W0.3) Select the countries/areas in which you operate.

Brazil
Netherlands
Spain
Thailand
United States of America

W0.4

(W0.4) Select the currency used for all financial information disclosed throughout your response.

EUR

W0.5

(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.

Companies, entities or groups over which financial control is exercised

W0.6

(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?

No

W0.7

(W0.7) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization.	Provide your unique identifier
Yes, a Ticker symbol	CRBN

W1. Current state

W1.1

(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital	Vital	For Corbion sufficient amounts of available good quality freshwater is vital for our direct operations because it is an essential ingredient in many of our food and chemical products. Freshwater is also vital for many heating, cooling and cleaning processes. Without access to good quality freshwater we would not be able to continue making our products and would have to use alternative methods to have access to water of sufficient quality. Our future use of good quality freshwater in our direct operations is expected to grow in line with our organic production growth. However, we do expect to be able to reduce our need of good quality freshwater by switching to recycled, brackish and/or produced water where possible, reducing our dependency on good quality freshwater. As a biobased company Corbion relies on many agricultural raw materials to produce our products. The need for sufficient amounts of good quality freshwater by our agricultural suppliers makes indirect water use also of vital importance to Corbion. We expect our indirect use of good quality freshwater to grow in line with our organic production growth.
Sufficient amounts of recycled, brackish and/or produced water available for use	Important	Important	Currently Corbion only uses small amounts of recycled, brackish and/or produced water in its direct operations to help reduce freshwater intake. Even though this water is substitutable by good quality freshwater, production processes depend on a continuous supply of good quality water, making this type of water also important for Corbion. We expect the use of this type of water to increase over time as we are looking to further reduce our direct freshwater intake and increase our water circularity. Sufficient amounts of recycled and/or produced water are important for our indirect water use. Our suppliers use this type of water for the irrigation of their crops. We expect that this type of water might become more important over time as rainfall patterns could change due to climate change and more irrigation might be needed.

W-FB1.1a

(W-FB1.1a) Which water-intensive agricultural commodities that your organization produces and/or sources are the most significant to your business by revenue? Select up to five.

Agricultural commodities	% of revenue dependent on these agricultural commodities	Produced and/or sourced	Please explain
Sugar	41-60	Sourced	The largest percentage of our revenue is related to sugar. Sugar is the main agricultural raw material for lactic acid production in Thailand, Brazil, the Netherlands and Spain, and for the production of Algae ingredients in Brazil. To calculate this figure, we looked at the % of revenues from all products derived from sugar from sugar cane or sugar beet. A product can contain more than one key agricultural commodity, meaning that the cumulative percentages of revenue dependent on any of the four commodities can be higher than 100%.
Palm oil	Less than 10%	Sourced	We have categorized our products into palm and non-palm derived. Palm oil and palm derivatives are used in the production of our emulsifiers and functional blends. To calculate this figure, we looked at the % of revenues from all products that are derived from, contain, or could contain palm oil or palm oil derivatives. A product can be derived from more than one key agricultural commodity, meaning that the cumulative percentages of revenue dependent on any of the four commodities can be higher than 100%.
Soy	10-20	Sourced	Soy oil is the main raw agricultural material for the production of emulsifiers in the US. It is also used in the production of our functional blends. To calculate this figure, we looked at the % of revenues from all products that are derived from, contain, or could contain soy. A product can contain more than one key agricultural commodity, meaning that the cumulative percentages of revenue dependent on any of the four commodities can be higher than 100%.
Maize	21-40	Sourced	Dextrose obtained from corn (maize) is a raw material for the production of lactic acid in USA. Corn and products containing corn are also used in the production of our emulsifiers and functional blends. To calculate this figure, we looked at the % of revenues from all products that are derived from, contain, or could contain corn or corn derivatives. A product can contain more than one key agricultural commodity, meaning that the cumulative percentages of revenue dependent on any of the four commodities can be higher than 100%.

W1.2

(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations	Please explain
Water withdrawals – total volumes	100%	Corbion actively manages all water withdrawals from all manufacturing sites. Information is collected based on flow-meters (continuously) or invoices (per invoice). The data is reported quarterly to the sustainability department. Any changes with regards to previous reporting periods have to be explained on a case-by-case basis.
Water withdrawals – volumes by source	100%	Corbion actively documents the source of all withdrawn water. We source water from groundwater (renewable), fresh surface water, and third-party sources (municipal water and purchased steam). The data is reported quarterly to the sustainability department. Any changes with regards to previous reporting periods have to be explained on a case-by-case basis.
Entrained water associated with your metals & mining sector activities - total volumes [only metals and mining sector]	<Not Applicable>	<Not Applicable>
Produced water associated with your oil & gas sector activities - total volumes [only oil and gas sector]	<Not Applicable>	<Not Applicable>
Water withdrawals quality	100%	Water quality is monitored and managed locally at each manufacturing site and the data is stored at the site level. The testing for each site is subject to local conditions and regulations and the data is stored on site. Some sites rely on data provided from municipal testing or third-party treatment facilities.
Water discharges – total volumes	100%	Corbion actively manages all water discharges from all manufacturing sites. Information is collected based on flow-meters (continuously) or invoices (per invoice). The data is reported quarterly to the sustainability department. Any changes with regards to previous reporting periods have to be explained on a case-by-case basis.
Water discharges – volumes by destination	100%	Corbion actively manages all water discharges from all manufacturing sites. Water is either treated on site and consequently discharged back into the original source (groundwater - renewable, or fresh surface water) or discharged to a third-party destination (municipal treatment facility). The data is reported quarterly to the sustainability department. Any changes with regards to previous reporting periods have to be explained on a case-by-case basis.
Water discharges – volumes by treatment method	100%	Corbion actively manages all water discharges from all manufacturing sites. Water is either treated on site and consequently discharged back into the original source (groundwater - renewable, or fresh surface water) or discharged to a third-party destination (municipal treatment facility). The data is reported quarterly to the sustainability department. Any changes with regards to previous reporting periods have to be explained on a case-by-case basis.
Water discharge quality – by standard effluent parameters	100%	Water quality data is measured and monitored at all of our manufacturing sites. The water effluent measurements tracked and recorded may differ at site level due to local regulations and discharge destination e.g. pH, COD, BOD, temperature, or TSS. The frequency of testing is also determined at site level with many sites measuring monthly for all relevant parameters and daily of some key parameters.
Water discharge quality – temperature	100%	Water temperature data is measured and monitored at each of the sites. The frequency of testing is determined at site level depending on local regulations and permits with many sites monitoring temperature on a continuous basis.
Water consumption – total volume	100%	Corbion actively manages all water withdrawn and all water discharged. Water consumption is then calculated subtracting the water discharged from the water withdrawn (C = W - D).
Water recycled/reused	Not monitored	This aspect is currently not material to Corbion because we do not operate in areas where water is a scarce commodity and required water is easily available in the desired quantities and quality. We are, however, in the process of re-evaluating the significance of recycled/reused water for Corbion as part of our participation in the Science Based Targets Network Corporate Engagement Program.
The provision of fully-functioning, safely managed WASH services to all workers	100%	Corbion provides clean and safe water at every facility to ensure the health and safety of all employees. This is continuously monitored at every facility.

W1.2b

(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, and how do these volumes compare to the previous reporting year?

	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total withdrawals	5456.11	Higher	Corbion uses water as a part of its operations in temperature control (steam and cooling water), product dilution, cleaning, and other WASH services. Cooling water can be withdrawn in large quantities and is returned in similar volumes to its original source nearby with negligible losses or variation in quality. In 2021 withdrawals increased by 14%. This is mainly due to production increases at our sites in Orindiuva, Brazil; Peoria, IL, USA and Rayong, Thailand. Future water use is also expected to increase due to production expansions. Our facility in Blair, Nebraska, USA will see increased production and corresponding rise in water withdrawals and our new factory in Rayong, Thailand (operational in 2023) will significantly increase our water withdrawals. Corbion has chosen that a difference of +/-5% will represent about the same, +5-30% will be higher, and +30% or more will be much higher and vice versa for lower.
Total discharges	4287.57	Higher	The total discharge of water increased since the previous reporting year with 14%. This increase is mainly due to an increase in production volume at our sites in Orindiuva, Brazil; Peoria, IL, USA and Rayong, Thailand. Future water discharge is expected to rise in line with our production capacity. This means that a minor increase is expected due to the expansion of our site in Blair, Nebraska, USA and a significant increase is expected when our new facility in Rayong, Thailand becomes operational in 2023. Corbion has chosen that a difference of +/-5% will represent about the same, +5-30% will be higher, and +30% or more will be much higher and vice versa for lower.
Total consumption	1168.54	Higher	The total water use in Corbion operations is obtained by adding together the water use, including water loss, that is reported from each manufacturing site. Corbion calculates this using the formula Consumption = Withdrawals – Discharges. Corbion's total water consumption was higher compared to the previous year because our production volume was higher (especially for Lactic Acid, which is relatively water intensive). We consumed approximately 14% more water in 2021 than we did in 2020. Our direct water consumption is tied into our production volumes. Because of a rising demand for our products and expanding capacity future water consumption is projected to increase in line with our output. Corbion has chosen that a difference of +/-5% will represent about the same, +5-30% will be higher, and +30% or more will be much higher and vice versa for lower.

W1.2d

(W1.2d) Indicate whether water is withdrawn from areas with water stress and provide the proportion.

	Withdrawals are from areas with water stress	% withdrawn from areas with water stress	Comparison with previous reporting year	Identification tool	Please explain
Row 1	Yes	11-25	About the same	WRI Aqueduct	Corbion uses the WRI Aqueduct tool to assess our sites for their current and future water stress. By putting in the coordinates of each of our sites into the WRI Aqueduct and assessing each site for water stress and water depletion we determined that two of our sites are located in water stressed areas. These are Montmeló, Spain and Totowa, New Jersey, USA. These two sites together represent just under 16% of our water withdrawals. Corbion also uses the WRI Aqueduct tool to monitor potential developments of water risk at each of our sites. Compared to the previous reporting year the withdrawals from water stressed areas has remained the same. Corbion has chosen that a difference of +/-5% will represent about the same, +5-30% will be higher, and +30% or more will be much higher and vice versa for lower.

W-FB1.2e

(W-FB1.2e) For each commodity reported in question W-FB1.1a, do you know the proportion that is produced/sourced from areas with water stress?

Agricultural commodities	The proportion of this commodity produced in areas with water stress is known	The proportion of this commodity sourced from areas with water stress is known	Please explain
Maize	Not applicable	Yes	Corbion sources dextrose derived from maize from Iowa, USA. According to the WRI aqueduct tool this area is currently not considered water stressed.
Palm oil	Not applicable	Yes	For palm oil, we focus on RSPO certification, which also includes management of water related topics. From our suppliers we know the countries from which our palm oil (derivative) is sourced. However we do not know the sourcing regions beyond country level for the majority of our sourced volume. Therefore we have performed the analysis based on country level water stress data using the WRI aqueduct country rankings. We know this is not exhaustive and not always representative for the true water stress, but we do not have the leverage within the palm oil supply chain to provide more detailed information.
Soy	Not applicable	Yes	Corbion sources it's soy from the USA. More specifically from Iowa, Missouri, Kansas and Nebraska. According to the WRI aqueduct tool the specific areas within these states that we source from are currently not considered water stressed.
Sugar	Not applicable	Yes	Corbion sources sugar derived from sugarcane and sugar beets from a multitude of countries. Using the WRI aqueduct tool we have identified sourcing locations that are considered to be water stressed in Thailand.

W-FB1.2g

(W-FB1.2g) What proportion of the sourced agricultural commodities reported in W-FB1.1a originate from areas with water stress?

Agricultural commodities	% of total agricultural commodity sourced from areas with water stress	Please explain
Maize	0%	Corbion sources it's maize from Iowa, USA. This is not considered to be a water stressed region by WRI Aqueduct. We do not expect to source from other locations in the near future. Although currently Iowa is not considered a water stressed area we continue monitoring any potential changes in our climate risk assessments in line with the TCFD.
Palm oil	Less than 1%	We source our palm oil from Malaysia and Indonesia. Both these countries are not considered water stressed by the WRI Aqueduct tool. We do not expect this to change in the near future. Nor do we expect to source from other regions in the near future. We rely on RSPO certification for place based action if water stress were to become an issue.
Soy	0%	Corbion sources it's soy from the USA. More specifically from Iowa, Missouri, Kansas and Nebraska. These areas are not considered to be water stressed regions by WRI Aqueduct. We do not expect to source from other locations in the near future. Although currently these areas are not considered water stressed we continue monitoring any potential changes in our climate risk assessments in line with the TCFD.
Sugar	26-50	Corbion sources its sugar from multiple countries including Brazil, France, the Netherlands, Thailand, and the USA. There are regions in Thailand where we source sugar that are considered to be water stressed by WRI Aqueduct. In total 29% of all sugar we source comes from water stressed areas. 8% of our total sourced volume comes from an area with extremely high water stress, however, the mill that is located in this area is Bonsucro certified, indicating good water stewardship practices. Also we will audit the mill in 2022 to verify, amongst other things, water consumption and water quality impacts. It is expected that we will continue sourcing sugar in similar quantities from these areas in the foreseeable future. Sugar sourced from water stressed areas in Thailand may rise when our new factory in Rayong, Thailand will become operational in 2023, however, this will likely not change the percentage sourced from water stressed areas. Being aware of the potential risks of sourcing sugar from water stressed areas we explicitly include this in our climate risk assessments and scenario analysis. We also include this information in our Security of Supply assessment to monitor any potential risks and/or issues on the short term.

W1.2h

(W1.2h) Provide total water withdrawal data by source.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	3051.06	Higher	Fresh surface water is important to Corbion because it is used for cooling and production processes at 3 of our 12 manufacturing facilities. Fresh surface water withdrawals have risen by 20% compared to last year. The majority of our freshwater withdrawals are at our Rayong, Thailand site where withdrawals increased due to an increase in production (capacity), accounting for the majority of the increase. Withdrawals of surface water are expected to remain roughly the same until the new facility in Rayong, Thailand becomes operational in 2023. Corbion has chosen that a difference of +/-5% will represent about the same, +5-30% will be higher, and +30% or more will be much higher and vice versa for lower.
Brackish surface water/Seawater	Not relevant	<Not Applicable>	<Not Applicable>	Corbion does not use brackish surface water or seawater in any of its operations. There are no future plans to rely on these sources.
Groundwater – renewable	Relevant	907.39	Higher	Groundwater is important to Corbion because it is used for cooling and production processes at 3 of our 12 manufacturing facilities. In Montmélo, Spain and Peoria, Illiniois it is our main source of water while in Orindiuva, Brazil it is used to supplement our surface water withdrawals. Groundwater withdrawals have risen by 10% compared to last year. This is mostly attributable to increased withdrawals at our site in Montmeló, Spain. These increased withdrawals were due to increased production volume. Future withdrawals are expected to stay the same. Corbion has chosen that a difference of +/-5% will represent about the same, +5-30% will be higher, and +30% or more will be much higher and vice versa for lower.
Groundwater – non-renewable	Not relevant	<Not Applicable>	<Not Applicable>	Corbion does not use non-renewable groundwater in any of its operations. There are no future plans to rely on these sources.
Produced/Entrained water	Not relevant	<Not Applicable>	<Not Applicable>	Corbion does not use produced or entrained water in any of its operations. There are no future plans to rely on these sources.
Third party sources	Relevant	1497.65	About the same	Corbion's use of third party sources comes mainly from the use of municipal water and to a lesser extent from purchased steam. Municipal water suppliers are used at a majority of Corbion manufacturing sites. Either as the primary source of water or to supplement groundwater and surface water. It is not used in Orindiúva, Brazil and Campos, Brazil. Use of municipal water and purchased steam has risen by 6%, which is attributable to variations in production with an overall upwards trend. Production growth and variations are also considered to drive use of municipal water in the future.

W1.2i

(W1.2i) Provide total water discharge data by destination.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water	Relevant	891.76	About the same	There have been no significant changes in the volumes of water discharged to fresh surface water compared to the previous reporting year.
Brackish surface water/seawater	Not relevant	<Not Applicable>	<Not Applicable>	We do not discharge any water directly to brackish surface water or seawater.
Groundwater	Not relevant	<Not Applicable>	<Not Applicable>	We do not discharge any water directly to groundwater.
Third-party destinations	Relevant	3395.8	Higher	Discharges to third-party destinations have increased in line with our increased production volume. The primary driver of this increase has been our factory in Rayong, Thailand, accounting for 63% of the 17% company-wide increase.

W1.2j

(W1.2j) Within your direct operations, indicate the highest level(s) to which you treat your discharge.

	Relevance of treatment level to discharge	Volume (megaliters/year)	Comparison of treated volume with previous reporting year	% of your sites/facilities/operations this volume applies to	Please explain
Tertiary treatment	Relevant	755.34	About the same	11-20	No significant changes compared to the previous reporting year. Discharges comply with regulatory requirements.
Secondary treatment	Relevant	2167.99	Higher	51-60	Our facility in Rayong, Thailand provides secondary treatment to its wastewater before discharging it to a third party WWT station. Increased discharge from this facility accounts for all increase here. Discharges comply with all regulatory requirements.
Primary treatment only	Relevant	1018.5	Higher	11-20	Increase in discharged wastewater that has received only primary treatment is due to increased discharge volumes at our facilities in Montmelo, Spain and Totowa, NJ, US. Wastewater that has only undergone primary treatment is always sent to a third party treatment facility and never discharged directly into the environment. Discharges comply with all regulatory requirements.
Discharge to the natural environment without treatment	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	Most of our water is discharged to third party treatment plants. Any water discharged directly into the environment is treated in compliance with regulatory requirements.
Discharge to a third party without treatment	Relevant	345.74	About the same	1-10	No significant changes compared to the previous reporting year. Discharges comply with all regulatory requirements.
Other	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	All of our discharge is covered in the above categories.

W1.3

(W1.3) Provide a figure for your organization's total water withdrawal efficiency.

	Revenue	Total water withdrawal volume (megaliters)	Total water withdrawal efficiency	Anticipated forward trend
Row 1	1070800000	5456	196260.997067449	We expect our total water withdrawal efficiency to remain the same for the foreseeable future.

W-CH1.3

(W-CH1.3) Do you calculate water intensity for your activities in the chemical sector?

No, and we have no plans to do so in the next two years

W-FB1.3

(W-FB1.3) Do you collect/calculate water intensity for each commodity reported in question W-FB1.1a?

Agricultural commodities	Water intensity information for this produced commodity is collected/calculated	Water intensity information for this sourced commodity is collected/calculated	Please explain
Maize	Not applicable	Yes	We source all of our maize from the US. Our suppliers provide us with region based sourcing data. In calculating the water intensity we follow the Blue Water Footprint methodology as developed by the Water Footprint Network. Using the datasets from the Water Footprint Network (Mekonnen, M.M. & Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, Hydrology and Earth System Sciences, 15(5): 1577-1600) we can calculate the total water withdrawals for irrigation for our sourced maize based on the regions of origin. Final value is an average of the blue water footprint in our different sourcing regions.
Palm oil	Not applicable	Yes	We source palm oil as both primary and secondary oleochemicals. Because of the complicated supply chain of palm oil we base our water intensity on the sourcing location data provided by our key suppliers. This location data is on accurate up to the country level. In calculating the water intensity we follow the Blue Water Footprint methodology as developed by the Water Footprint Network. Using the datasets from the Water Footprint Network (Mekonnen, M.M. & Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, Hydrology and Earth System Sciences, 15(5): 1577-1600) we can calculate the total water withdrawals for irrigation for our sourced palm oil based on the countries of origin. Final value is an average of the blue water footprint in our different sourcing regions.
Soy	Not applicable	Yes	We source all of our soy from the US. Our suppliers provide us with region based sourcing data. In calculating the water intensity we follow the Blue Water Footprint methodology as developed by the Water Footprint Network. Using the datasets from the Water Footprint Network (Mekonnen, M.M. & Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, Hydrology and Earth System Sciences, 15(5): 1577-1600) we can calculate the total water withdrawals for irrigation for our sourced soy based on the regions of origin. Final value is an average of the blue water footprint in our different sourcing regions.
Sugar	Not applicable	Yes	We source all of our cane sugar from mills in Brazil and Thailand. These mills in turn provide us with the locations of the farms they source from. In calculating the water intensity we follow the Blue Water Footprint methodology as developed by the Water Footprint Network. Using the datasets from the Water Footprint Network (Mekonnen, M.M. & Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, Hydrology and Earth System Sciences, 15(5): 1577-1600) we can calculate the total water withdrawals for irrigation for our sourced sugar based on the regions of origin. Final value is an average of the blue water footprint in our different sourcing regions.

W-FB1.3b

(W-FB1.3b) Provide water intensity information for each of the agricultural commodities identified in W-FB1.3 that you source.

Agricultural commodities

Maize

Water intensity value (m3)

2

Numerator: Water aspect

Total water withdrawals

Denominator

Tons

Comparison with previous reporting year

About the same

Please explain

Water intensity for sourced maize is based on the total water withdrawals for irrigation. This is in line with the Blue Water Footprint methodology for agricultural materials as developed by the Water Footprint Network. Using the datasets from the Water Footprint Network (Mekonnen, M.M. & Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, Hydrology and Earth System Sciences, 15(5): 1577-1600). We calculate the total water withdrawals for irrigation based on the sourcing locations. Average water intensity is update yearly based on the distribution of sourcing regions from our suppliers for that year. In 2021 all of our maize was sourced from Iowa, US. Water intensity per ton of product is used to decouple the intensity from variations in sourcing volumes. We use this information for our work with the Science Based Targets Network Corporate Engagement Program. Water intensity is about the same compared to the previous reporting year because the distribution of sourcing regions from our suppliers has remained the same and there have been no updates to the database. Corbion has chosen that a difference of +/-5% will represent about the same, +5-30% will be higher, and +30% or more will be much higher and vice versa for lower.

Agricultural commodities

Palm oil

Water intensity value (m3)

0.12

Numerator: Water aspect

Total water withdrawals

Denominator
Tons

Comparison with previous reporting year
Lower

Please explain
Water intensity for sourced palm oil is based on the total water withdrawals for irrigation. This is in line with the Blue Water Footprint methodology for agricultural materials as developed by the Water Footprint Network. Using the datasets from the Water Footprint Network (Mekonnen, M.M. & Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, Hydrology and Earth System Sciences, 15(5): 1577-1600). We calculate the total water withdrawals for irrigation based on the sourcing locations. Average water intensity is update yearly based on the distribution of sourcing regions from our suppliers for that year. In 2021 the distribution was 31.8% from Indonesia, 58.6% from Malaysia, and 11.6% from the rest of the world. Water intensity per ton of product is used to decouple the intensity from variations in sourcing volumes. We use this information for our work with the Science Based Targets Network Corporate Engagement Program. Water intensity is lower compared to the previous reporting year because the distribution of sourcing regions has changed. Corbion has chosen that a difference of +/-5% will represent about the same, +5-30% will be higher, and +30% or more will be much higher and vice versa for lower.

Agricultural commodities
Soy

Water intensity value (m3)
340.5

Numerator: Water aspect
Total water withdrawals

Denominator
Tons

Comparison with previous reporting year
About the same

Please explain
Water intensity for sourced soy is based on the total water withdrawals for irrigation. This is in line with the Blue Water Footprint methodology for agricultural materials as developed by the Water Footprint Network. Using the datasets from the Water Footprint Network (Mekonnen, M.M. & Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, Hydrology and Earth System Sciences, 15(5): 1577-1600). We calculate the total water withdrawals for irrigation based on the sourcing locations. Average water intensity is update yearly based on the distribution of sourcing regions from our suppliers for that year. Water intensity per ton of product is used to decouple the intensity from variations in sourcing volumes. We use this information for our work with the Science Based Targets Network Corporate Engagement Program. Water intensity is about the same compared to the previous reporting year because the distribution of sourcing regions from our suppliers has remained the same and there have been no updates to the database. Sourcing regions are Iowa, Nebraska, Kansas, and Missouri, US. Corbion has chosen that a difference of +/-5% will represent about the same, +5-30% will be higher, and +30% or more will be much higher and vice versa for lower.

Agricultural commodities
Sugar

Water intensity value (m3)
176.58

Numerator: Water aspect
Total water withdrawals

Denominator
Tons

Comparison with previous reporting year
Much higher

Please explain
Water intensity for sourced sugar is based on the total water withdrawals for irrigation. This is in line with the Blue Water Footprint methodology for agricultural materials as developed by the Water Footprint Network. Using the datasets from the Water Footprint Network (Mekonnen, M.M. & Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, Hydrology and Earth System Sciences, 15(5): 1577-1600). We calculate the total water withdrawals for irrigation based on the sourcing locations. Average water intensity is update yearly based on the distribution of sourcing regions from our suppliers for that year. Water intensity per ton of product is used to decouple the intensity from variations in sourcing volumes. We use this information for our work with the Science Based Targets Network Corporate Engagement Program. Water intensity is much higher compared to the previous reporting year because the distribution of sourcing regions from our suppliers has changed and there have been no updates to the database. Corbion has chosen that a difference of +/-5% will represent about the same, +5-30% will be higher, and +30% or more will be much higher and vice versa for lower.

W1.4

(W1.4) Do you engage with your value chain on water-related issues?
Yes, our suppliers

W1.4a

(W1.4a) What proportion of suppliers do you request to report on their water use, risks and/or management information and what proportion of your procurement spend does this represent?

Row 1

% of suppliers by number
Less than 1%

% of total procurement spend
1-25

Rationale for this coverage
A sustainable agricultural supply chain is crucial to our business as we rely on agriculture for our biobased raw materials. Corbion is not directly involved with the growing, harvesting, and processing of the crops used to make our raw materials. We partner with our direct suppliers, conservation solution providers and engage with other stakeholders involved in our agricultural supply chains to promote our vision for sustainable agriculture. Sugar (derived from sugar cane) is our main raw material for our core product lactic acid and for the production of Algae-based ingredients. We use sugar in Brazil (1 lactic acid plant, 1 algae ingredients plant) and in Thailand (1 lactic acid plant, 2nd lactic acid under construction, plant to start-up in 2023). Sugar cane farming depends on sufficient water availability and quality. 29% of our total sugar supply is sourced from areas with water stress and we find in practice that the sugar cane yield is negatively impacted by drought. We therefore request our sugar suppliers for information on their water-use, risks and other relevant information related to water through our cane sugar code and audits and by requesting the Bonsucro and/or the Renovabio calculator from our sugar suppliers. We currently prioritize our efforts on this % of our suppliers because of the importance of this raw material for our business. For our other agricultural raw materials, we use other programs or certification.

Impact of the engagement and measures of success
We purchase Bonsucro certified sugar or audit our cane sugar suppliers against the Corbion Cane Sugar Code if they are not yet able to deliver Bonsucro-certified sugar. Regarding water, we require that consumed kg of water per kg of product does not exceed 130 kg/kg sugar cane (Farm) and 20 kg per kg sugar (Mill) and that improvement can be observed in re-assessments. We also require that the sugar cane farmers maintain a water conservation plan aimed at maximizing water use efficiency and minimizing water quality impacts from waste water discharges, erosion and nutrient/agrochemical runoff. The plan should also contain targets for reducing water consumption per ton of sugar cane. processed. If the requirement is not met, we request a corrective action plan. The main measure of success is the % of our cane sugar consumption meeting the requirements of our code. We aim for 100% verified compliance for our sugar supply by 2025. In 2021, we verified that 73% of our total cane sugar consumption meets the requirements of our code compared to 66% in 2020. This includes around 17% Bonsucro-certified sugar.

Comment

W1.4b

(W1.4b) Provide details of any other water-related supplier engagement activity.

Type of engagement
Innovation & collaboration

Details of engagement
Encourage/incentivize innovation to reduce water impacts in products and services
Provide training and support on sustainable agriculture practices to improve water stewardship

% of suppliers by number
1-25

% of total procurement spend
1-25

Rationale for the coverage of your engagement
Corbion's key raw materials are derived from agricultural sources so our approach is based on continuous improvement in sustainable agriculture practices. In 2020 we entered into a partnership with Cargill and Practical Farmers of Iowa to develop a soil health program targeting corn and soy growers in the sourcing region surrounding Corbion's manufacturing facility in Blair, Nebraska. The program is focused on the adoption of soil health practices, including no till, planting of cover crops, and nutrient management. It aims to deduce GHG emissions, increase soil organic matter, increase farmer resilience, improve water quality, and leverage technical assistance and farmer-farmer networks to drive change. The program has three elements: cost share for growers implementing cover crops; technical and peer support network; and monitoring and evaluation of outcomes towards supply chain sustainability goals. We currently focus on the implementation of this practice for our dextrose supplier. The program serves as a pilot and we are currently engaging with the suppliers of our other key agricultural raw materials to initiate similar programs in other regions.

Impact of the engagement and measures of success
Improved water use and quality in our dextrose supply chain. Because this is a partnership we collect data together with our Tier 1 supplier (Cargill) from our Tier 2 suppliers (farmers) to assess progress on soil health on an annual basis. For this specific partnership the goal is to reach and impact farmers collectively amounting to 20% of our sourcing area. Data is collected on an annual basis. This is a pilot project and the data will be used to determine the potential and value of scaling up our efforts. We measure success through farmer surveys and aim for positive feedback from the farmers on the application of covers crops. The majority of farmers in this program indicated that the cost share helped them increase the number of cover crop acres they planted. If this program had not existed, farmers reported they would have planted fewer acres of cover crops. The program includes a learning event through Practical Farmers of Iowa to increase knowledge on cover crop practices and to connect farmers to each other.

Comment

W2. Business impacts

W2.1

(W2.1) Has your organization experienced any detrimental water-related impacts?
No

W2.2

(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?

No

W3. Procedures

W-CH3.1

(W-CH3.1) How does your organization identify and classify potential water pollutants associated with its activities in the chemical sector that could have a detrimental impact on water ecosystems or human health?

All sites need to measure and report their standard water pollutants to the environmental report such as COD, Nitrogen, heavy metals, as well as water temperature and pH. All our sites have an on-site waste water treatment plant or send the waste water to a third party for treatment. Beyond that, each process change needs to be reviewed through a risk assessment to determine risk of potential pollutants going into ground- and surface water. Each new chemical requires approval permit that allows the affected department, the quality manager, and the EHS manager to review the new chemical. We use SDS (safety data sheets) as a first step to identify if a certain material is a pollutant. If the chemical was a potential water pollutant it would be placed in the storm water pollution prevention plan, and a plan would be created to prevent the chemical from reaching any water source.

All our lactic acid derivatives sites comply to ISO 14001 Environmental management system with water risk assessment being reviewed annually as a part of it.

W-CH3.1a

(W-CH3.1a) Describe how your organization minimizes adverse impacts of potential water pollutants on water ecosystems or human health. Report up to ten potential pollutants associated with your activities in the chemical sector.

Potential water pollutant	Value chain stage	Description of water pollutant and potential impacts	Management procedures	Please explain
Nitrogen	Direct operations	Nitrogen-based compounds are used as nutrients in our fermentation. It can reach rivers and lakes through improper treatment of our effluents or incidents. it can have high impact to the eutrophication in the water ecosystem at certain concentration level and it might have toxic impact to aquatic life as a result of eutrophication.	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages	Samples of waste water effluent are taken regularly to control the effluent quality. Limits of chemicals in the waste water are determined by local regulations. We do have measures to prevents spillage and leakage in our loading and unloading areas.
Phosphorus	Direct operations	Phosphorus-based compounds are used as nutrients in our fermentation. It can reach rivers and lakes through improper treatment of our effluents or incidents. it can have high impact to the eutrophication in the water ecosystem at certain concentration level and it might have toxic impact to aquatic life as a result of eutrophication.	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages	Samples of waste water effluent are taken regularly to control the effluent quality. Limits of chemicals in the waste water are determined by local regulations. We do have measures to prevents spillage and leakage in our loading and unloading areas.
heavy metals (Arsenium, Cadmium, Chrome, Cobalt, Lead, Nickel, Zink)	Direct operations	Heavy metals may be present as impurities in our production process. They may be highly toxic even in small quantities. That is why it is of upmost importance to measure their concentration and prevent them from reaching the freshwater	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages	Samples of waste water effluent are taken regularly to control the effluent quality. Limits of chemicals in the waste water are determined by local regulations. We do have measures to prevents spillage and leakage in our loading and unloading areas.
COD/BOD	Direct operations	High oxygen concentration can affect aquatic life	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages	Samples of waste water effluent are taken regularly to control the effluent quality. Limits of chemicals in the waste water are determined by local regulations. We do have measures to prevents spillage and leakage in our loading and unloading areas.
Lactic acid	Distribution network	Lactic acid which is produced in Corbion is classified as a corrosive substance. We need to consider this during packaging and transportation to prevent leakage and spillage. Each transport provider receives transport cards that clarify what the risks are of transporting this chemical (risk of water and soil pollution) and are instructed how to use and handle the product.	Measures to prevent spillage, leaching, and leakages Providing best practices instructions on product use	Samples of waste water effluent are taken regularly to control the effluent quality. Limits of chemicals in the waste water are determined by local regulations. We do have measures to prevents spillage and leakage in our loading and unloading areas.

W-FB3.1

(W-FB3.1) How does your organization identify and classify potential water pollutants associated with its food, beverage, and tobacco sector activities that could have a detrimental impact on water ecosystems or human health?

All sites need to measure and report their standard water pollutants to the environmental report such as COD, Nitrogen, heavy metals, as well as water temperature and pH. All our sites have an on-site waste water treatment plant or send the waste water to a third party for treatment. Beyond that, each process change needs to be reviewed through a risk assessment to determine risk of potential pollutants going into ground- and surface water. Each new chemical requires an approval permit that allows the affected department, the quality manager, and the EHS manager to review the new chemical. We use SDS (safety data sheets) as a first step to identify if a certain material is a pollutant. If the chemical is a potential water pollutant it would be placed in the storm water pollution prevention plan, and a plan would be created to prevent the chemical from reaching any water source.

We comply with legal requirements with regards to the discharge of water pollutants at all our sites. This is done through a combination of on-site and off-site treatment of effluents. Our food production facilities (Totowa and Araucaria) have not identified pollutants that could have a detrimental impact on water ecosystems. At our Totowa site discharge water quality is monitored through regular grab sampling by a third-party and consecutively send to a third party treatment facility. At our Araucaria site we discharge to a third party treatment facility that monitors water quality.

Potential impacts in our supply chain are addressed via our responsible sourcing program; the topic is included in our supplier code and in specific raw material policies. We request our suppliers to sign the supplier code/specific policies, we audit our high risk suppliers and we purchase part of the high risk raw materials certified (RSPO, Bonsucro).

All our chemical production facilities have more extensive discharge quality testing due to higher pollution risk. All our lactic acid derivatives sites comply to ISO 14001 Environmental management system with water risk assessment being reviewed annually as a part of it.

W-FB3.1a

(W-FB3.1a) Describe how your organization minimizes the adverse impacts of potential water pollutants on water ecosystems or human health associated with your food, beverage, and tobacco sector activities.

Potential water pollutant
Fertilizers

Activity/value chain stage
Agriculture – supply chain

Description of water pollutant and potential impacts
Impacts of the use of fertilizers in our supply chain may include the pollution of watercourses and groundwater.

Management procedures
Change raw material inputs
Follow regulation standards
Other, please specify (Suppliers code of conduct, certification, supplier audits)

Please explain
All our suppliers need to meet our supplier code. We source our main agricultural raw materials responsibly, and therewith ensure the use of fertilizers is according to external standards. All our palm oil and primary oleochemicals are RSPO certified. For our sugarcane we use Bonsucro certification and our own Sugar cane code. We request our suppliers to sign the supplier code/specific policies, we audit our high risk suppliers and we purchase part of the high risk raw materials certified (RSPO, Bonsucro). In case of non-compliance and/or the identification of specific risks we will put in place a risk mitigation plan. This can mean either working together to increase compliance or switching to another supplier (mix).

Potential water pollutant
Pesticides and other agrochemical products

Activity/value chain stage
Agriculture – supply chain

Description of water pollutant and potential impacts
Potential impacts of the use of agrochemicals in our supply chain include the pollution of water ecosystems and aquatic life. Pesticides may be spread to other species and negatively affect them.

Management procedures
Change raw material inputs
Follow regulation standards
Other, please specify (Supplier code of conduct, certification, supplier audits)

Please explain
All our suppliers need to meet our supplier code. We source our main agricultural raw materials responsibly, and therewith ensure the use of fertilizers is according to external standards. All our palm oil and primary oleochemicals are RSPO certified. For our sugarcane we use Bonsucro certification and our own Sugar cane code. We request our suppliers to sign the supplier code/specific policies, we audit our high risk suppliers and we purchase part of the high risk raw materials certified (RSPO, Bonsucro). In case of non-compliance and/or the identification of specific risks we will put in place a risk mitigation plan. This can mean either working together to increase compliance or switching to another supplier (mix).

W3.3

(W3.3) Does your organization undertake a water-related risk assessment?

Yes, water-related risks are assessed

W3.3a

(W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.

Value chain stage

Direct operations
Supply chain

Coverage

Full

Risk assessment procedure

Water risks are assessed as part of an established enterprise risk management framework

Frequency of assessment

Annually

How far into the future are risks considered?

More than 6 years

Type of tools and methods used

Tools on the market
Enterprise risk management

Tools and methods used

Water Footprint Network Assessment tool
WRI Aqueduct
COSO Enterprise Risk Management Framework

Contextual issues considered

Water availability at a basin/catchment level
Water quality at a basin/catchment level
Implications of water on your key commodities/raw materials
Water regulatory frameworks
Status of ecosystems and habitats
Access to fully-functioning, safely managed WASH services for all employees

Stakeholders considered

Customers
Employees
Investors
Local communities
Regulators
Suppliers
Water utilities at a local level
Other water users at the basin/catchment level

Comment

W3.3b

(W3.3b) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.

To provide specific input regarding water-related risks, our primary tools are WRI aqueduct, Water Footprint Network, Life Cycle Assessments and Scenario Analysis. WRI aqueduct is used to assess the water risks at a basin level for all of our manufacturing sites and key agricultural commodities. The Water Footprint Network is used to assess the impact of our key agricultural commodities. In case of severe water stress we aim to reduce our impact and dependencies accordingly. Currently we do not operate in areas with severe water stress. By assessing the water footprint of our key commodities we get more insight into the potential exposures to droughts and extreme weather events. This information allows us to better select our raw material suppliers and sourcing regions. Life cycle assessments allow us to monitor the product water footprint and communicate this with suppliers and investors so that they can manage their exposure. Scenario analysis is used to estimate potential (emerging) future water risks along the entire value chain. Using this tool in line with the TCFD requirements we are able to test and adjust our strategy to climatic changes before they pose significant risks. All collected information is finally assessed in our established enterprise risk management framework (COSO).

In our water risk assessments we monitor water availability and water stress in the basins we operate in and source from. We do this using WRI aqueduct. We consider the implications of water on our key commodities using the Water Footprint Network assessment tool. Water quality and the status of ecosystems and habitats is considered in our assessment in line with the SBTN guidelines on water. Regulatory frameworks are always considered because we are dedicated to always be compliant with them wherever we operate or source.

In our assessments multiple stakeholders are considered. Customers are considered because of the impact of our water use in their supply chain and because we want to assure security of supply for them. Investors are always considered in our risk assessments because of the potential impact on shareholder value. Employees are considered in the availability of WASH-services on all of our manufacturing sites and office locations. Suppliers are assessed in our risk assessment because of potential water-related risks in our (agricultural) supply chain. Regulators are always considered because we are dedicated to be in compliance with them in all regions we operate in or source from. Because water is a local and contextual issue - on a basin level - we always consider the needs of local communities and other users in terms of water quantity and quality demand. Water utilities are always considered because we source much of our water from them and discharge much of it back to them for treatment.

Water-related risks are managed in the same way as other risks. Corbion has defined a governance model that identifies clear reporting and accountability structures in line with the Dutch Corporate Governance Code. The Executive Committee is responsible for:
• identifying and analyzing the risks associated with Corbion's strategy and activities;
• establishing the risk appetite, as well as ensuring that mitigating measures are being put in place;
• the design, implementation, and operation of Corbion's internal risk management and control systems; and
• monitoring the operation of the internal risk management and control systems and assessing the design and effectiveness thereof.

The Board of Management discusses the effectiveness of the design and operation of the internal risk management and control systems with the Audit Committee and the Supervisory Board annually. For each significant risk, a risk owner is appointed, who will further determine the impacts of the risk and manage the root causes and mitigation actions. The progress in risk mitigation is discussed on an ongoing basis between business management and Board of Management.

Corbion applies the 3-lines-of-defence model for internal controls. The first line (line management) is responsible for the operational effectiveness of the internal control framework. The second line coordinates, advises, and monitors line management regarding their responsibilities for internal control. The third line is internal audit independently reviewing the control framework.

W4. Risks and opportunities

W4.1

(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?
No

W4.1a

(W4.1a) How does your organization define substantive financial or strategic impact on your business?

A definition of 'substantive financial or strategic impact' when identifying or assessing water-related risks

Part of the control environment is the definition by the Executive Committee of the risk appetite of the company. Our risk appetite is the amount of risk we are willing to accept to achieve our strategic goals. This requires adequate understanding and awareness of potential risks and their magnitude within the company. The level of risk appetite is set by the Executive Committee. Corbion utilizes a 6 category impact scale for risks. Category 5&6 (major and catastrophic) are considered to be substantive. This also applies to water-related impacts.

A description of the quantifiable indicator(s) used to define substantive financial or strategic impact

As a financial metric, any EBITDA impact >15M euro is considered to be substantial, or (estimated) direct or indirect losses are larger than 50% of the risk appetite or a(n estimated) share price decline of >5%. This also applies to water-related impacts.

An example of potentially substantive impact considered

We have currently not identified any water-related risks that have a potentially substantive impact on Corbion. Closest to having a substantive impact is the flooding of the Missouri river disrupting supply at our Blair facility. The estimated maximum impact of such an event ranges from 9mln - 11mln euros.

W4.2b

(W4.2b) Why does your organization not consider itself exposed to water risks in its direct operations with the potential to have a substantive financial or strategic impact?

	Primary reason	Please explain
Row 1	Risks exist, but no substantive impact anticipated	We are using the WRI Aqueduct tool to prioritize (chronic) water risks for our direct operations. Sites in high and extreme high risk regions, based on the WRI Aqueduct overall water risk assessment, would be assessed for potential financial consequences in a detailed risk assessment to determine the potential financial impact on Corbion business and to determine our strategic response. Based on the WRI Aqueduct overall water risk assessment none of the 12 Corbion sites is in the High or Extremely high water risk area. The assessment results are as follows : 4 Corbion sites are in the low (0-1) water risk area, 6 sites are in the low-medium (1-2) water risk area, 2 sites are in the medium-high (2-3) water risk area. Water risks related to extreme weather events (acute risks) are monitored through our Enterprise Risk Management and scenario analysis in line with the TCFD recommendations. One example of an identified acute risk is flooding of the Missouri river to cause disruptions at our Blair facility. Estimated impacts hereof are not considered substantial with an estimated maximum impact range of €9mln - €11mln.

W4.2c

(W4.2c) Why does your organization not consider itself exposed to water risks in its value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact?

	Primary reason	Please explain
Row 1	Risks exist, but no substantive impact anticipated	We are using the WRI Aqueduct tool to prioritize water risks for our main agricultural suppliers. Sourcing locations in high and extreme high risk regions, based on the WRI Aqueduct overall water risk assessment, would be assessed for potential financial consequences in a detailed risk assessment to determine the potential financial impact on Corbion business and to determine our strategic response. Based on the WRI Aqueduct tool, our sugar in Thailand is sourced from areas with low, medium-high, and extremely high water stress, our sugar in Brazil from low-medium and medium-high water risk areas. Glucose and soy in US are from a low water risk area. We are reassessing the water risk in our supply chain in an annual basis, to cover potential changes resulted from a change in suppliers. The sugar sourced from areas with extremely high water stress is not considered posing a substantive risk because the (one) mill that is located in this area is Bonsucro certified, indicating good water stewardship practices. Also we will audit the mill in 2022 to verify, amongst other things, water availability, water consumption and water quality impacts. This will further inform us as to the level of risk originating from this sourcing location.

W4.3

(W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes, we have identified opportunities, and some/all are being realized

W4.3a

(W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.

Type of opportunity
Resilience

Primary water-related opportunity
Increased resilience to impacts of climate change

Company-specific description & strategy to realize opportunity
We entered into a partnership with Cargill and Practical Farmers of Iowa to develop a soil health program targeting corn and soy growers in the sourcing region surrounding Corbion's manufacturing facility in Blair, Nebraska. Our collaboration with Cargill and Practical Farmers of Iowa focusses on implementing regenerative agriculture practices such as cover crops, no or reduced tillage, and managed livestock grazing. These practices will have impacts on building climate resiliency by reducing GHG emissions, improving soil health and water resources. Specific to water, cover crops and no-till agriculture play a particularly helping role in improving water infiltration and water quality.

Estimated timeframe for realization
Current - up to 1 year

Magnitude of potential financial impact
Low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
0

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact
Because it concerns a pilot project that is up for evaluation after this year there are no expected financial benefits in the current timeframe of the project. However, we see regenerative agriculture as the way forward and think that it will provide significant benefits in the mid- to long-term future.

Type of opportunity
Resilience

Primary water-related opportunity
Increased supply chain resilience

Company-specific description & strategy to realize opportunity
At the moment, only one sugar mill is located in an area of very high water stress. In terms of overall water risk, only a negligible amount (<1% of sugar)of Corbion's agricultural raw materials (e.g. sugar cane, corn, soy, palm) are sourced from very high water risk areas. This may change in the future as a consequence of climate change. To be prepared for this, Corbion takes a pro-active approach and we have a responsible sourcing program that aims to implement sustainable agricultural practices, such as Bonsucro certification for sugar (the sugar we currently source from high risk areas is Bonsucro certified). This pro-active approach can be an opportunity for Corbion to ensure that we work with suppliers that are well-prepared and therefore more resilient to potential impacts of climate change. We purchase Bonsucro certified sugar or audit our cane sugar suppliers against the Corbion Cane Sugar Code if they are not yet able to deliver Bonsucro-certified sugar. Regarding water, we require that consumed kg of water per kg of product does not exceed 130 kg/kg sugar cane (Farm) and 20 kg per kg sugar (Mill) and that improvement can be observed in re-assessments. We also require that the sugar cane farmers maintain a water conservation plan aimed at maximizing water use efficiency and minimizing water quality impacts from waste water discharges, erosion and nutrient/agrochemical runoff. The plan should also contain targets for reducing water consumption per ton of sugar cane. processed. If the requirement is not met, we request a corrective action plan. In terms of our soy sourcing we entered into a partnership with Cargill and Practical Farmers of Iowa to develop a soil health program targeting corn and soy growers in the sourcing region surrounding Corbion's manufacturing facility in Blair, Nebraska. The program is focused on the adoption of soil health practices, including no till, planting of cover crops, and nutrient management. It aims to deduce GHG emissions, increase soil organic matter, increase farmer resilience, improve water quality, and leverage technical assistance and farmer-farmer networks to drive change.

Estimated timeframe for realization
More than 6 years

Magnitude of potential financial impact
Low-medium

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
0

Potential financial impact figure – maximum (currency)
2000000

Explanation of financial impact
It is difficult to estimate the financial impact of increased agricultural resilience because the prime driver of this is avoided damages. Because of this we have made a conservative estimate of benefits ranging from €0 to €2 mln.

W6. Governance

W6.1

(W6.1) Does your organization have a water policy?

No, but we plan to develop one within the next 2 years

W6.2

(W6.2) Is there board level oversight of water-related issues within your organization?

Yes

W6.2a

(W6.2a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.

Position of individual	Please explain
Chief Executive Officer (CEO)	Under the chairmanship of the Chief Executive Officer, the members of the Executive Committee have the overall responsibility for sustainability and decide on the strategy and targets. The Executive Committee shares responsibility for developing objectives and the strategy, determining the risk profile, and implementing strategic and operational policies . The CEO is given these responsibilities because sustainability is key to Corbion's strategy and therefore responsibilities are integrated in the highest management level. Due to Corbion's reliance on water for its fermentation processes and its agricultural raw materials, water is a relevant topic in our sustainability strategy. An example of a water management related decision made by the CEO in the past two years is the decision to partner with Cargill and Practical farmers of Iowa to promote regenerative agricultural practices in our corn and soy supply chain. Amongst other things regenerative agriculture improves water efficiency of farms and resilience against drought and extreme precipitation events.

W6.2b

(W6.2b) Provide further details on the board's oversight of water-related issues.

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - some meetings	Reviewing and guiding annual budgets Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding strategy Reviewing and guiding corporate responsibility strategy Setting performance objectives	Annually, there are two formal meetings with the full Executive Committee (ExCo), where sustainability is discussed. The ExCo members have informal meetings as well, these cover whatever important matters arise, varying from sustainability to risks or profits. The information provided by the ExCo and sustainability manager gives the board oversight on whether objectives are being reached and what the difficulties are in those areas. When deciding on major capital expenditures sustainability criteria are taken into consideration. This provides the board with oversight on the issues they might face and what possibilities there are for improvement or what options there are to improve the (sustainability) performance of Corbion.

W6.2d

(W6.2d) Does your organization have at least one board member with competence on water-related issues?

	Board member(s) have competence on water-related issues	Criteria used to assess competence of board member(s) on water-related issues	Primary reason for no board-level competence on water-related issues	Explain why your organization does not have at least one board member with competence on water-related issues and any plans to address board-level competence in the future
Row 1	Yes	Sufficient knowledge of the water demand of our direct operations and its relation to the local (basin) context Sufficient knowledge of natural processes, climate change, and water cycles Sufficient knowledge of financial impacts related to agricultural practices (seasonal variations, precipitation patterns & climate change impacts)	<Not Applicable>	<Not Applicable>

W6.3

(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).

Name of the position(s) and/or committee(s)
Chief Executive Officer (CEO)

Responsibility
Assessing future trends in water demand
Assessing water-related risks and opportunities
Managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues
Quarterly

Please explain
Under the chairmanship of the Chief Executive Officer, the members of the Executive Committee have the overall responsibility for sustainability and decide on the strategy and targets. The CEO gets scheduled quarterly updates on sustainability which always include any decisions related to water management. Reports focus, among other things, on strategic water management decisions, process improvements and investments. Water related responsibilities of the CEO stretch from strategic decisions within the supply chain (e.g. our collaboration with Cargill and Practical farmers of Iowa) to decisions on water targets. The CEO has these responsibilities because sustainability is key to Corbion's strategy. Because Sustainability is at the heart for Corbion's offerings it is logical that all key players within Corbion's management carry responsibility for delivering on sustainability.

Name of the position(s) and/or committee(s)
Other C-Suite Officer, please specify (Chief Science and Sustainability Officer)

Responsibility
Assessing future trends in water demand
Assessing water-related risks and opportunities
Managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues
Quarterly

Please explain
Under the chairmanship of the Chief Executive Officer, the members of the Executive Committee have the overall responsibility for sustainability and decide on the strategy and targets. The Executive Committee consists of the CEO, CFO, the CSSO (Chief Science & Sustainability Officer), the Chief Operations Officer, the Chief Human Resources Officer, the President of Sustainable Food Solutions, the President Lactic Acid & Specialties and the President Algae Ingredients. The Senior Director Sustainability provides recommendations to the Executive Committee (semi-annual), regarding sustainability, including water-related topics. The Senior Director Sustainability reports to the CSSO. For Corbion, sustainability and climate change offer opportunities and are a driver for innovation, hence the strong involvement of the CSSO.

W6.4

(W6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?

	Provide incentives for management of water-related issues	Comment
Row 1	No, and we do not plan to introduce them in the next two years	

W6.5

(W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?
No

W6.6

(W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?
Yes (you may attach the report - this is optional)

W7. Business strategy

W7.1

(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	11-15	Currently our water related business objectives are aimed at sustainable water use and risk mitigation. We are using the WRI Aquaduct tool and scenario analysis to prioritize water risks for our direct operations and supply chain. We aim to use water sustainably based on the local basin conditions. Because many of our factories are located near their key raw materials, long-term (>10y) water stewardship of these critical materials is a key business objective. In operations water related issues are integrated based on the WRI Aquaduct overall water risk assessment and local expertise and experience. Issues will be addressed if a site is located in high or extremely high water risk areas. None of the 12 Corbion sites is located in such an area. In our supply chain we focus on water stress. Issues will be addressed if we source from regions with high or extremely high water stress. Based on the WRI Aquaduct tool, most of our sugar in Thailand is sourced from areas with high (3-4) water stress, our sugar in Brazil primarily from low-medium (1-2) water stress areas. One mill in Thailand is located in an area with extremely high water stress. Corn and soy in the US are from a low water risk area. We are reassessing the water risk in our supply chain on an annual basis. One of our objectives to mitigate water-related risks is to keep a diversified mix of suppliers in all regions.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	11-15	Because none of our sites is currently located in a high or extremely high water risk area there is no need for direct mitigation plans. In the long term we aim to keep our site's water use within local limits. To anticipate this we perform scenario analysis to identify any changes in water availability and water related extreme weather events in a timely manner. We have joined the SBTN CEP as we aim to quantify our fair share of water use and set targets accordingly. In our supply chain we also aim to source raw materials that have been grown or produced with respect for the local water conditions. For example, in the US we entered into a partnership with Cargill and Practical Farmers of Iowa to develop a soil health program targeting corn and soy growers surrounding Corbion's facility in Blair. It focusses on the adoption of soil health practices, including no till, planting of cover crops, and nutrient management. It aims to, amongst other things, improve water quality. Because of the long lead time in regenerative agriculture we think that investing now will set us up for future demand, cost incurred now will pay-off in the long-term (>2030), hence the time horizon of 11-15 years. For sugar cane we use audits and Bonsucro certification and maintain a diversified mix of suppliers. Bonsucro requires that consumed kg of water per kg of product does not exceed 130 kg/kg sugar cane (Farm) and 20 kg per kg sugar (Mill) and that improvement can be observed in re-assessments.
Financial planning	Yes, water-related issues are integrated	11-15	Because water related issues have the potential to become financially significant in the future because of e.g. climate change they are integrated in our long term financial planning. For example, we invest in the promotion of regenerative agriculture project in our partnerships with Cargill and Practical Farmers of Iowa. This is currently a pilot project, but we see regenerative agriculture as the way forward and think that it will provide significant benefits in the mid- to long-term future. We also invest in certification schemes such as Bonsucro to ensure good (water) management practices in our supply chain. Because of the long lead time in regenerative agriculture we think that investing now will set us up for future demand, for example when our customers are intensifying their scope three reductions, increasing supplier sustainability standards and are working towards net-zero. Cost incurred now will pay-off in the long-term (>2030), hence the time horizon of 11-15 years. We continually invest within our direct operations to keep our water infrastructure up-to-date, prevent any leakages and keep water use within proportion of the local basin conditions (mitigation) and to protect our assets from water-related threats such as floods (adaptation).

W7.2

(W7.2) What is the trend in your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?

Row 1

Water-related CAPEX (+/- % change)

-60

Anticipated forward trend for CAPEX (+/- % change)

0

Water-related OPEX (+/- % change)

0

Anticipated forward trend for OPEX (+/- % change)

0

Please explain

In 2021 there were two large water-related capital expenditures. This year CAPEX is expected to return to a "normal" level. OPEX hasn't changed significantly and isn't expected to in the near future.

W7.3

(W7.3) Does your organization use scenario analysis to inform its business strategy?

	Use of scenario analysis	Comment
Row 1	Yes	We use RCP2.6 combined with a tailored 1.5-degrees aligned transition scenario to determine potentially relevant events and developments that could be a risk or opportunity. This included events such as implementation of (local) carbon pricing, changing demand for e.g. meat and biobased plastics, and stakeholder pressure to reduce GHG emisssions in line with the 1.5 pathway. RCP 8.5 was used (quantitative) to determine potentially relevant events for the 'business as usual' scenario, specific to the relevant Corbion locations. This included events such as storms, floods and droughts. The results of this scenario analysis and the potential risks and opportunities that were identified have informed our Advance 2025 strategy update and business plans for the next 5 years. This includes among others the decision to implement a breakthrough technology for lactic acid production with a significantly lower carbon and water footprint in Thailand.

W7.3a

(W7.3a) Provide details of the scenario analysis, what water-related outcomes were identified, and how they have influenced your organization's business strategy.

	Type of scenario analysis used	Parameters, assumptions, analytical choices	Description of possible water-related outcomes	Influence on business strategy
Row 1	Water-related Climate-related Socioeconomic	The 1.5-degrees aligned transition scenario was customized using the En-ROADS climate action simulator. Population parameters are based on UN DESA scenarios. Economic growth is set at 1.5% (long-term). Carbon prices were set to increase towards €150/ton over the course of 10 years. Energy and commodity prices are derived by the model based on different input parameters. Other scenarios that have been used as input to the customized scenario include SSP1 and IEA NZE 2050. The RCP2.6 physical risk scenario has been included in the transition scenario to create a combined risk scenario. Population parameters are based on UN DESA scenarios. Economic growth is set at 1.5% (long-term). Carbon prices were set to increase towards €150/ton over the course of 15 years, starting in 2025. Energy and commodity prices are derived by the model based on different input parameters. The En-ROADS climate action simulator has also been used in this scenario. The RCP 8.5 scenario also used input from the 2020 McKinsey Global Institute report: Climate risk and response: Physical hazards and socioeconomic impacts. In this scenario there are no mitigation actions. Continued use of fossil fuels will keep energy and commodity prices stable in the short-term, but these will be affected by climate disasters and other disruptions in the mid- and long-term.	RCP 8.5 was used (quantitative) to determine potentially relevant events for the 'business as usual' scenario, specific to the relevant Corbion locations. This included events such as storms, floods and droughts. Increased frequency of extreme weather (storms & floods) could cause a disruption to our manufacturing & distribution network, either because of a direct impact on our own manufacturing sites, or through disruption of the supply of raw materials. An example of a historic incident is the flooding of the Missouri river near to our facility in Blair, Nebraska, USA. We expect this to happen again in the near future (<10y) with a high likelihood. Water related outcomes in the transition scenario are currently considered to be insignificant, but future updates might highlight potentially significant water-related outcomes also in this scenario.	Performing scenario analysis has made us more aware of potential risks and how they might develop in the future. For water-related risks it has taught us that we cannot rely blindly on precipitation patterns and water availability as we have done in the past. This has for example supported our decision to implement a breakthrough technology for lactic acid production with a significantly lower carbon and water footprint in Thailand. It has also influenced our risk management and sourcing strategy. We are currently extending our scenario analysis efforts to a more local scale. In the context of water-related risks this means that we will look at basin level risks in the near future.

W7.4

(W7.4) Does your company use an internal price on water?

Row 1

Does your company use an internal price on water?

No, and we do not anticipate doing so within the next two years

Please explain

No internal price on water is currently integrated into Corbion's operations.

W7.5

(W7.5) Do you classify any of your current products and/or services as low water impact?

	Products and/or services classified as low water impact	Definition used to classify low water impact	Primary reason for not classifying any of your current products and/or services as low water impact	Please explain
Row 1	No, but we plan to address this within the next two years	<Not Applicable>	Important but not an immediate business priority	We currently do not classify any of our products as having a low water impact. This is primarily because it has a lower priority than analyzing our portfolio for low-carbon impacts. Once the climate-related assessments are completed we might move towards water-related assessment, because we do believe that at least some of our products will classify as such.

W8. Targets

W8.1

(W8.1) Describe your approach to setting and monitoring water-related targets and/or goals.

	Levels for targets and/or goals	Monitoring at corporate level	Approach to setting and monitoring targets and/or goals
Row 1	Our company sets no targets or goals	<Not Applicable>	<Not Applicable>

W8.1c

(W8.1c) Why do you not have water target(s) or goal(s) and what are your plans to develop these in the future?

	Primary reason	Please explain
Row 1	We are planning to introduce a target or goal within the next two years	Based on our initial water risk assessment we have identified no high water risk in our direct operations nor in our supply chain . Therefore, we consider that the development of water-related targets is not our immediate business priority. On the other hand, we are reviewing our approach and updating the risk assessment on an annual basis and may consider setting a target in the future. As a first step on the way to setting a (science based) water target we have joined the Corporate Engagement Program from the Science Based Target Network. We are now actively pursuing the opportunity to set a science based water target within the next two years in line with the SBTN timeline.

W9. Verification

W9.1

(W9.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1a)?

Yes

W9.1a

(W9.1a) Which data points within your CDP disclosure have been verified, and which standards were used?

Disclosure module	Data verified	Verification standard	Please explain
W1 Current state	Water withdrawal at each Corbion site	Other, please specify (GRI standard)	We report according the water-related KPIs from the GRI standard

W10. Sign off

W-FI

(W-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

W10.1

(W10.1) Provide details for the person that has signed off (approved) your CDP water response.

	Job title	Corresponding job category
Row 1	CEO	Chief Executive Officer (CEO)

W10.2

(W10.2) Please indicate whether your organization agrees for CDP to transfer your publicly disclosed data on your impact and risk response strategies to the CEO Water Mandate's Water Action Hub [applies only to W2.1a (response to impacts), W4.2 and W4.2a (response to risks)].

Yes

SW. Supply chain module

SW0.1

(SW0.1) What is your organization's annual revenue for the reporting period?

	Annual revenue
Row 1	1070800000

SW1.1

(SW1.1) Could any of your facilities reported in W5.1 have an impact on a requesting CDP supply chain member?

No facilities were reported in W5.1

SW1.2

(SW1.2) Are you able to provide geolocation data for your facilities?

	Are you able to provide geolocation data for your facilities?	Comment
Row 1	Yes, for all facilities	

SW1.2a

(SW1.2a) Please provide all available geolocation data for your facilities.

Identifier	Latitude	Longitude	Comment
Brazil - Campos	-21.75873	-41.326718	The geolocation data for all Corbion manufacturing sites has been provided.
Brazil - Orindiuva	-20.182654	-49.349197	The geolocation data for all Corbion manufacturing sites has been provided.
Netherlands - Gorinchem	51.84	4.99	The geolocation data for all Corbion manufacturing sites has been provided.
Spain - Montmelo	41.55	2.26	The geolocation data for all Corbion manufacturing sites has been provided.
Thailand - Rayong	12.73	101.05	The geolocation data for all Corbion manufacturing sites has been provided.
USA - Blair	35.51	-78.32	The geolocation data for all Corbion manufacturing sites has been provided.
USA - Totowa	40.89	-74.23	The geolocation data for all Corbion manufacturing sites has been provided.
USA - Dolton	41.63	-87.61	The geolocation data for all Corbion manufacturing sites has been provided.
USA - Grandview	38.87	-94.55	The geolocation data for all Corbion manufacturing sites has been provided.
USA - Tucker	33.85	-84.17	The geolocation data for all Corbion manufacturing sites has been provided.
USA - Peoria	40.7	-89.58	The geolocation data for all Corbion manufacturing sites has been provided.
Brazil - Araucaria	-25.55	-49.4	The geolocation data for all Corbion manufacturing sites has been provided.

SW2.1

(SW2.1) Please propose any mutually beneficial water-related projects you could collaborate on with specific CDP supply chain members.

Requesting member
Flowers Foods Inc

Category of project
Other

Type of project
Other, please specify (joint regenerative agriculture project)

Motivation
Corbion is open to explore opportunities to initiate a joint project on promoting and implementing regenerative agriculture practices in our shared supply chain. For instance in collboration with shared wheat suppliers or other shared suppliers.

Estimated timeframe for achieving project
2 to 3 years

Details of project
To be defined together with a local partner. Option include: a cost share to incentivize farmers to improve their agricultural practices, training, farmer networking activities.

Projected outcome
Regenerative agriculture has the potential to improve soil health and store more carbon in the soil, which reduces GHG emissions. In addition, farms see improved profitability because better soil health creates better yields, and less is spent on chemicals and fuel. Improved land utilization frees up less-profitable acres for conservation. Improved nutrient utilization helps preserve and protect water quality. Reduced chemical use lowers health risks for farmers and consumers. Soils rich in organic matter are better able to manage moisture when faced with extreme events like floods and drought.

SW2.2

(SW2.2) Have any water projects been implemented due to CDP supply chain member engagement?
No

SW3.1

(SW3.1) Provide any available water intensity values for your organization's products or services.

Product name
Multiple products

Water intensity value
56355

Numerator: Water aspect
Water withdrawn

Denominator
Total withdrawals in m3

Comment
This is a volume based assessment on plant level. Values apply to the total volume of products supplied to Flowers Food in 2021.

Product name
Multiple products

Water intensity value
6611

Numerator: Water aspect
Water consumed

Denominator
Total consumption in m3

Comment
This is a volume based assessment on plant level. Values apply to the total volume of products supplied to Flowers Food in 2021.

Product name
Multiple products

Water intensity value
19684

Numerator: Water aspect
Water withdrawn

Denominator
Total withdrawals in m3

Comment
This is a volume based assessment on plant level. Values apply to the total volume of products supplied to Sigma in 2021.

Product name
Multiple products

Water intensity value
2052

Numerator: Water aspect
Water consumed

Denominator
Total consumption in m3

Comment
This is a volume based assessment on plant level. Values apply to the total volume of products supplied to Sigma in 2021.

Submit your response

In which language are you submitting your response?
English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

The European Climate Pact Submission

Please indicate your consent for CDP to showcase your disclosed environmental actions on the European Climate Pact website as pledges to the Pact.
Yes, we wish to pledge to the European Climate Pact through our CDP disclosure

Please confirm below
I have read and accept the applicable Terms